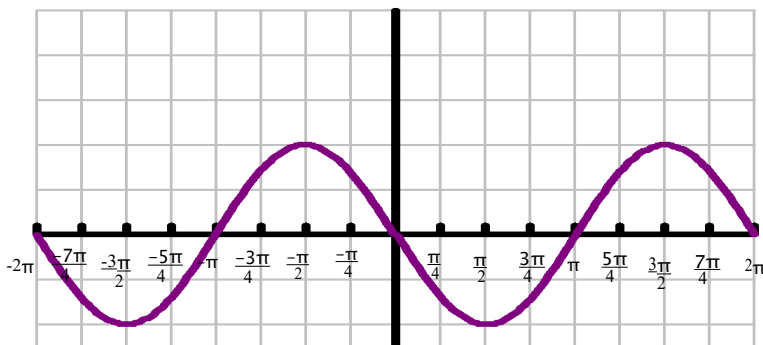


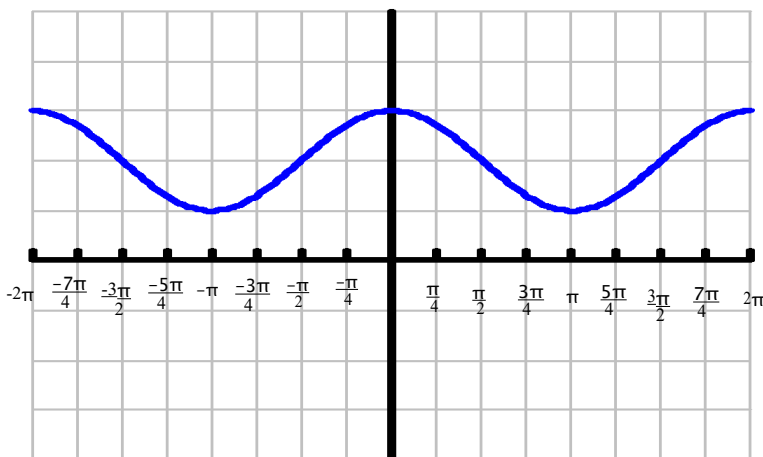
Warm up

Write the equation

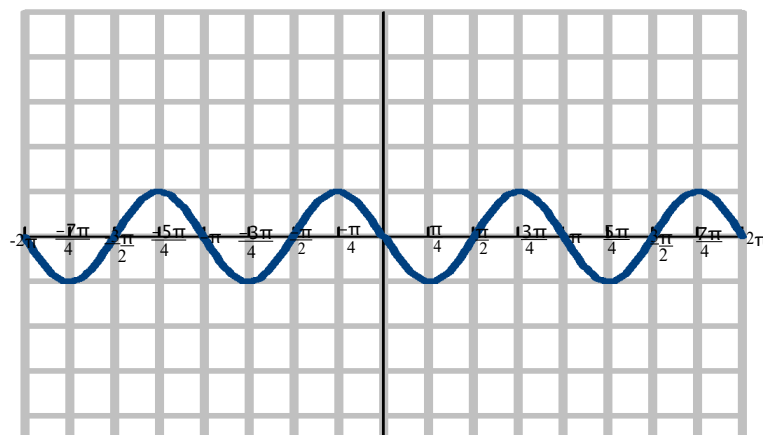
$y = -2\sin x$



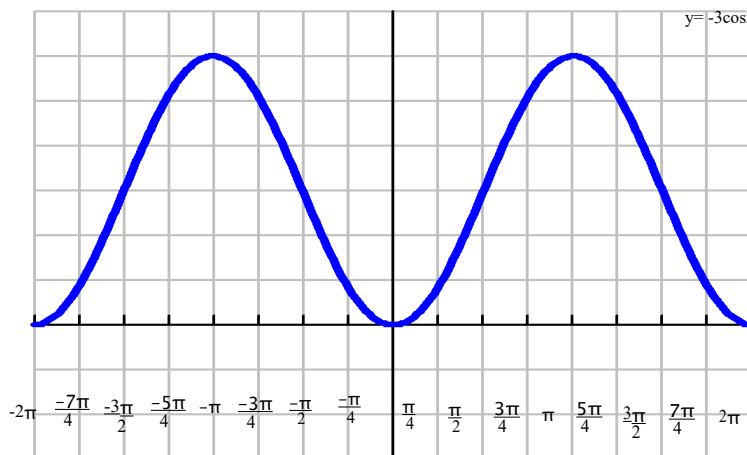
$y = 2 + \cos x$



$y = -\sin 2x$



$y = -3\cos x + 3$



4.6 Graphing the Other Trigonometric Functions

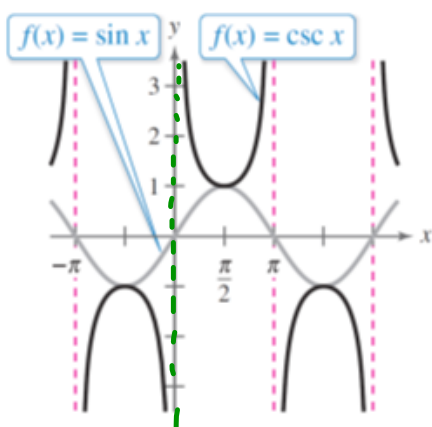
Secant and Cosecant

Reciprocal functions

$$\sec \theta = \frac{1}{\cos x}$$

$$\csc \theta = \frac{1}{\sin x}$$

Library of Parent Functions: Cosecant and Secant Functions



Domain: all real numbers $x, x \neq n\pi$

Range: $(-\infty, -1] \cup [1, \infty)$

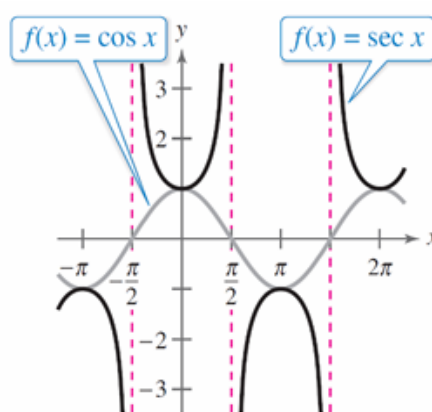
Period: 2π

No intercepts

Vertical asymptotes: $x = n\pi$

Odd function

Origin symmetry



Domain: all real numbers $x, x \neq \frac{\pi}{2} + n\pi$

Range: $(-\infty, -1] \cup [1, \infty)$

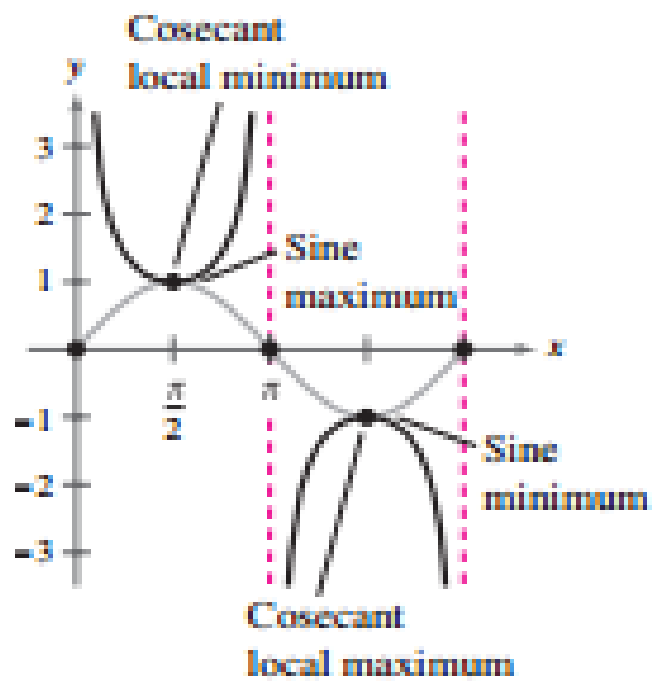
Period: 2π

y-intercept: $(0, 1)$

Vertical asymptotes: $x = \frac{\pi}{2} + n\pi$

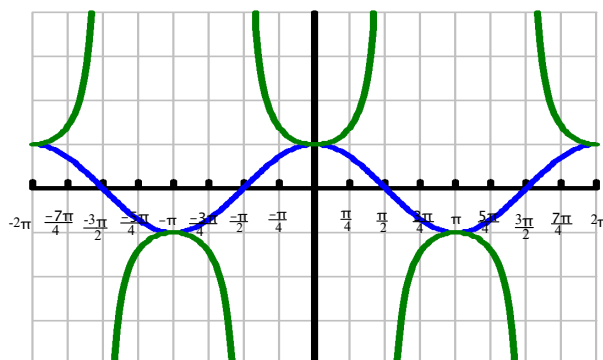
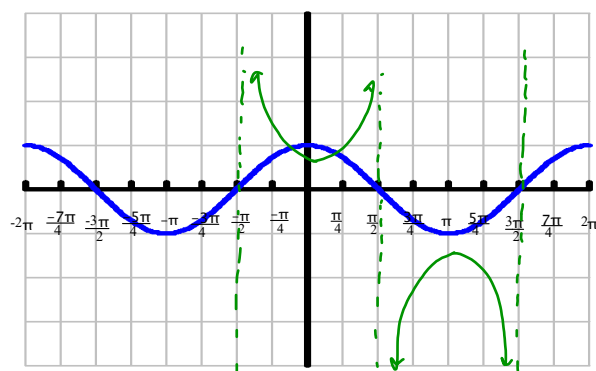
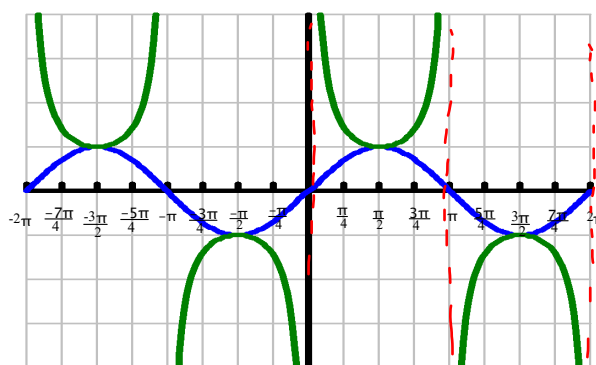
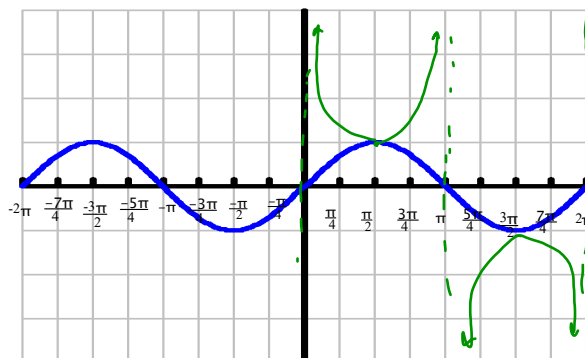
Even function

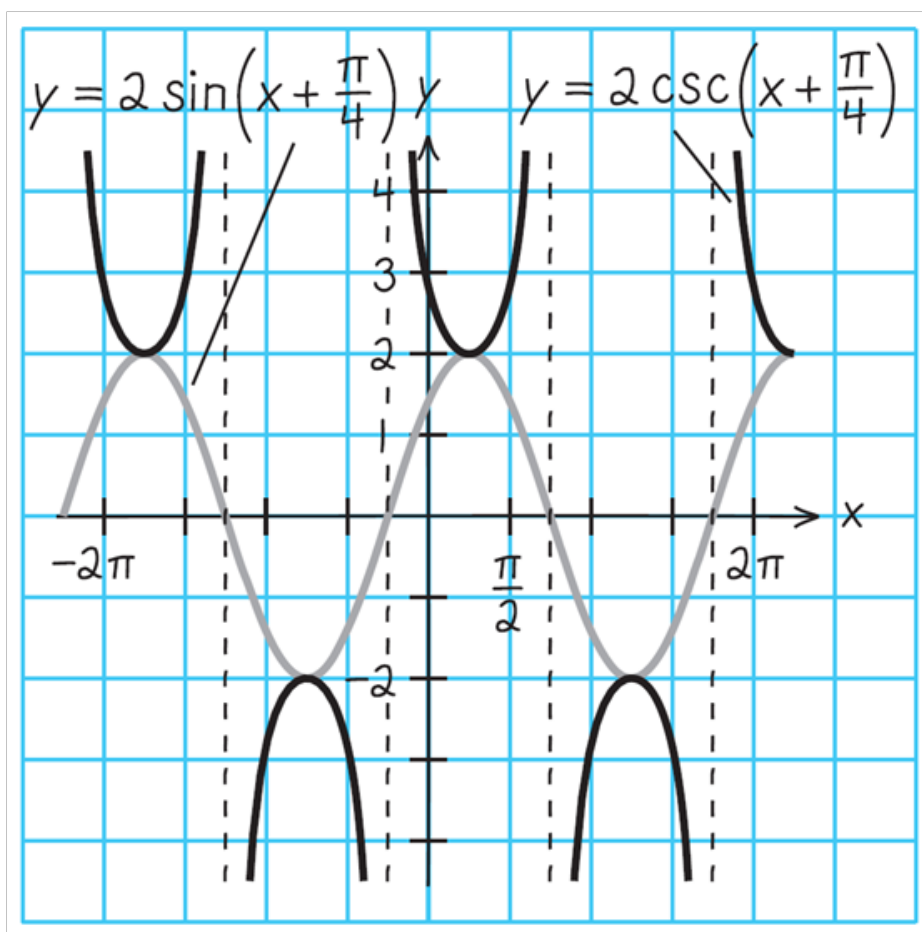
y-axis symmetry

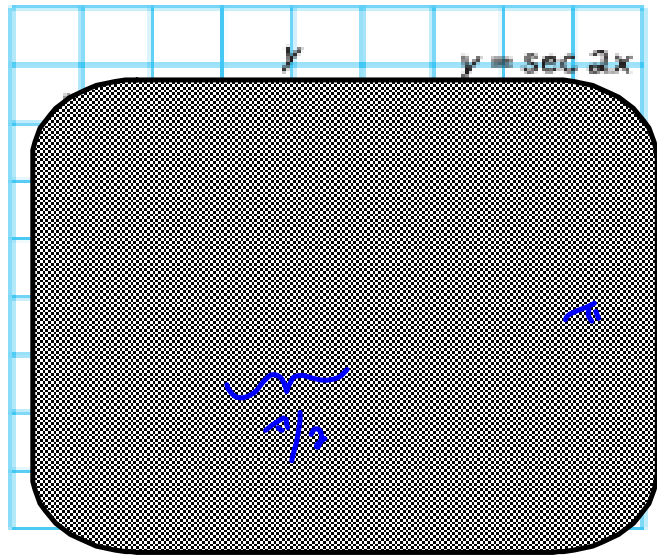


Bumps Touch

- x intercepts of sine (cosine) are the asymptotes of cosecant (secant)
- period is the same as sine and cosine

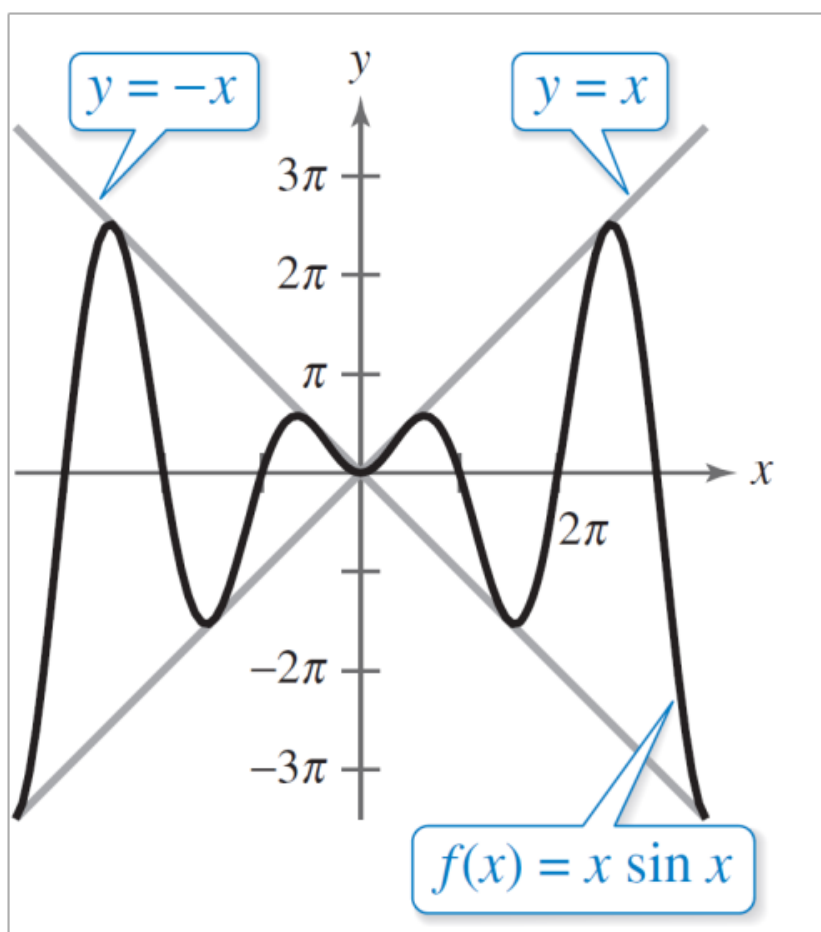


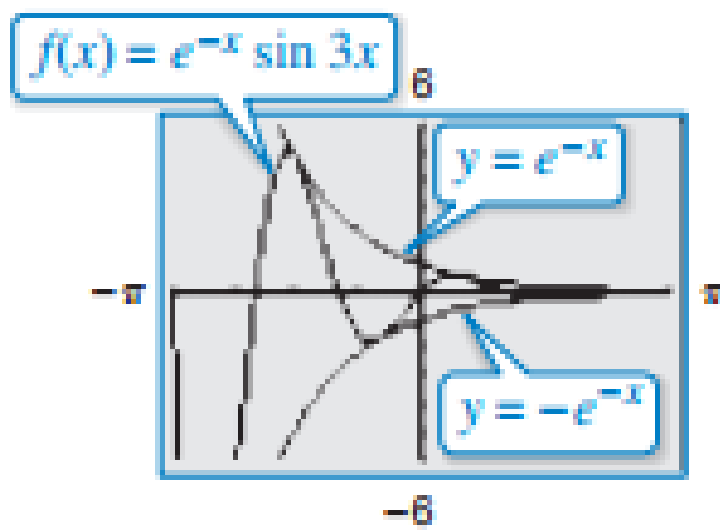


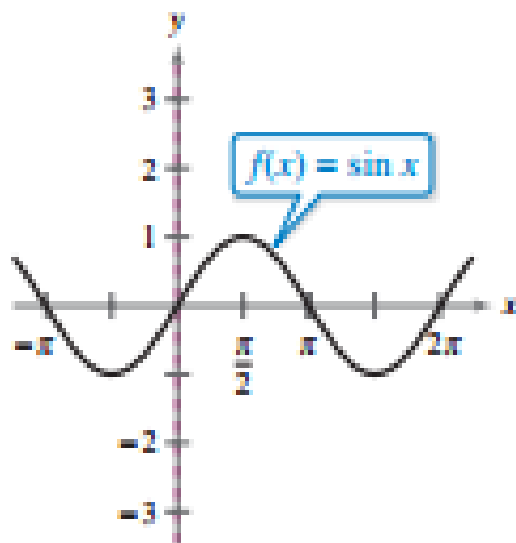


$$x = \frac{\pi}{4} + \frac{\pi}{2} \cdot n$$

Damped Trigonometric Graphs



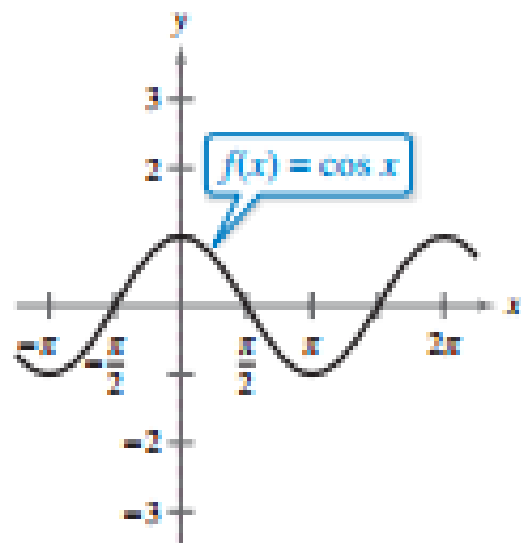




Domain: all real numbers x

Range: $[-1, 1]$

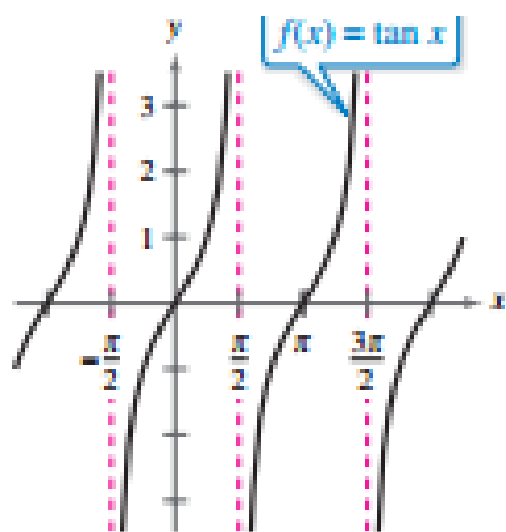
Period: 2π



Domain: all real numbers x

Range: $[-1, 1]$

Period: 2π

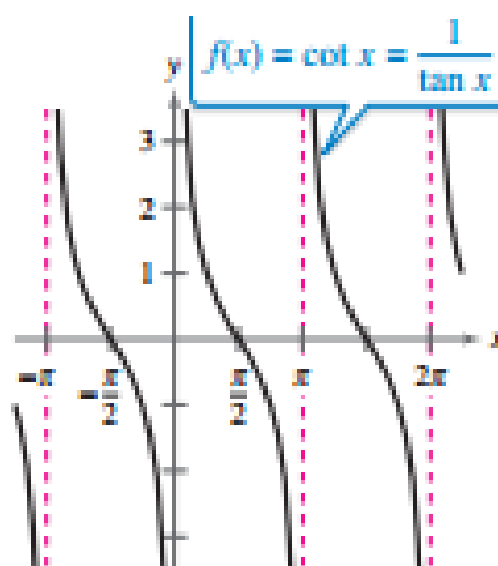


Domain: all real numbers x ,

$$x \neq \frac{\pi}{2} + n\pi$$

Range: $(-\infty, \infty)$

Period: π

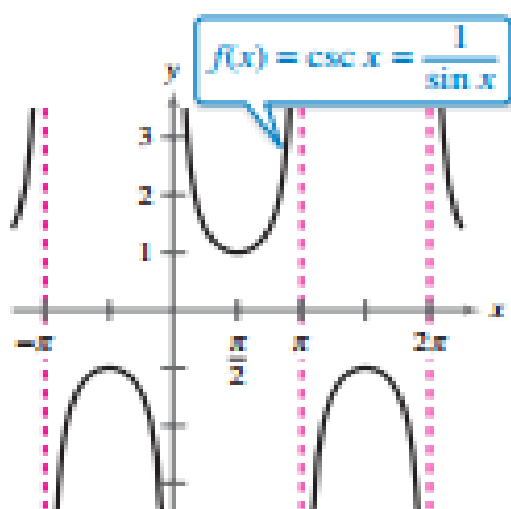


Domain: all real numbers x ,

$$x \neq n\pi$$

Range: $(-\infty, \infty)$

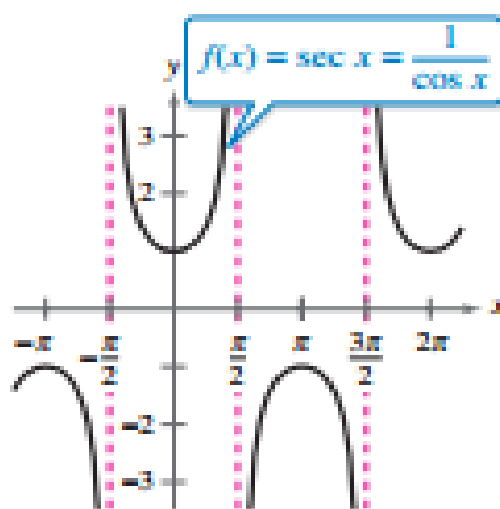
Period: π



Domain: all real numbers x ,
 $x \neq n\pi$

Range: $(-\infty, -1] \cup [1, \infty)$

Period: 2π



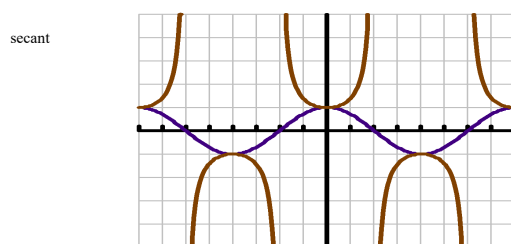
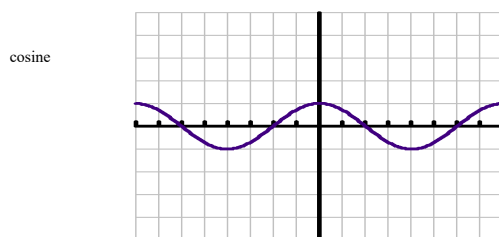
Domain: all real numbers x ,
 $x \neq \frac{\pi}{2} + n\pi$

Range: $(-\infty, -1] \cup [1, \infty)$

Period: 2π

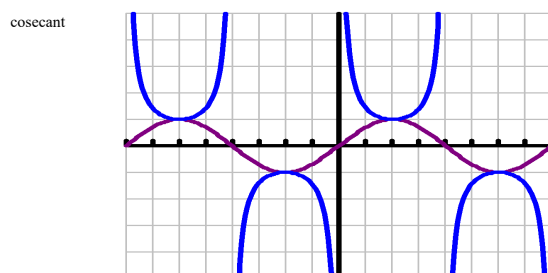
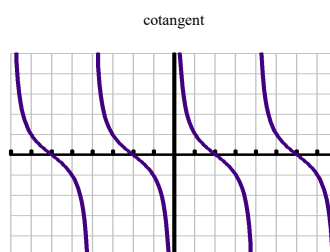
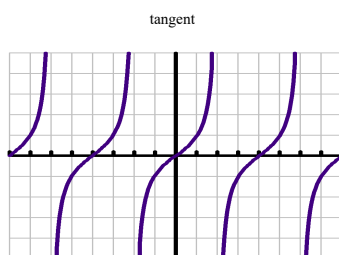
Even/Odd Functions

cosine and its reciprocal(secant): even
look graphically



Everything else ODD

- **tangent and cotangent**
- **sine and cosecant:**



Answer the following with a partner. One paper per group!

1

	period	domain	range	x-intercepts	y-intercepts	asymptotes
properties of the graph $y = \tan x$						
properties of the graph $y = \cot x$						

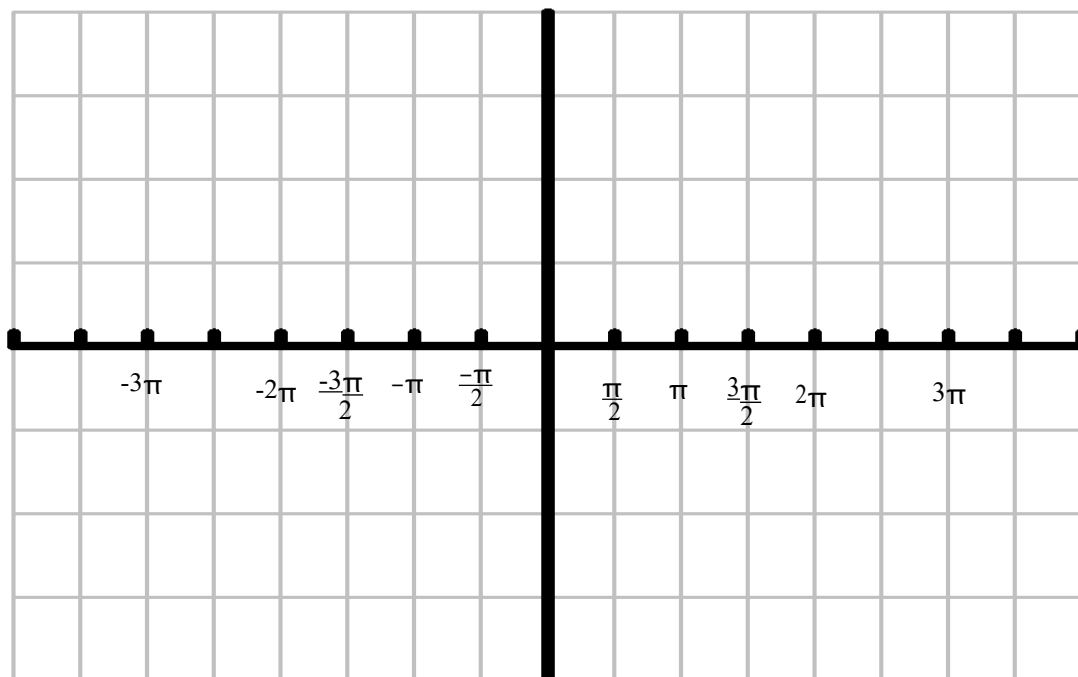
Graph each of the following.

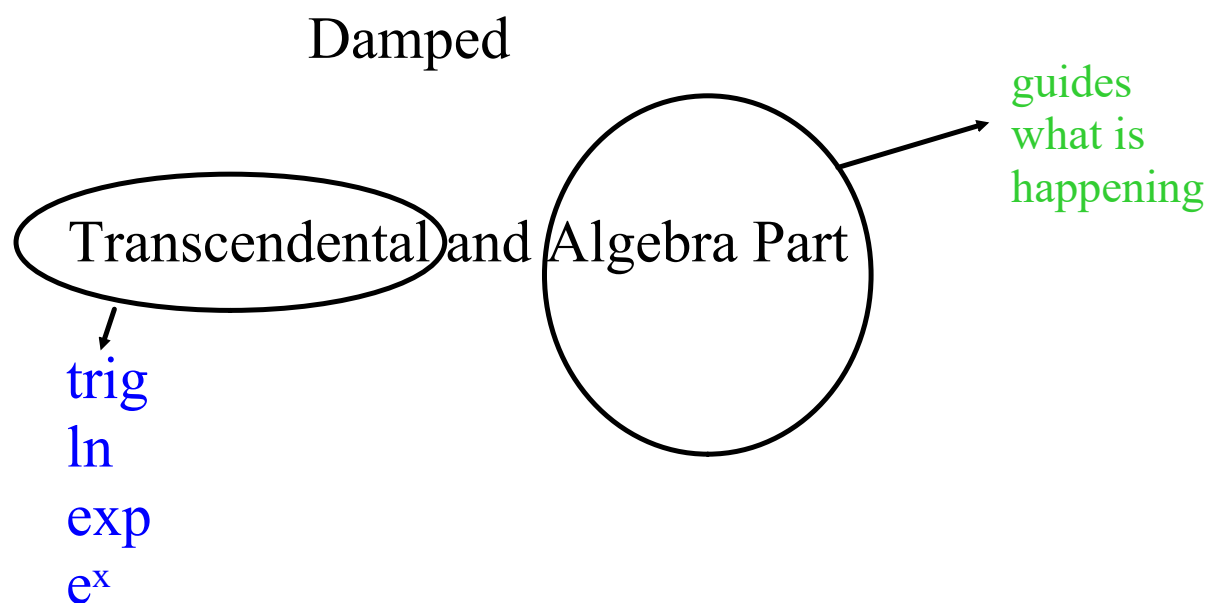
2. $f(x) = 3\sec 2x$

3. $f(x) = -2\csc x$

4. $f(x) = 1 + 2\sin(2x)$

5. $f(x) = \tan(2x)$





example $y = x \cos(x)$

put function in y_1

$$y_2 = x$$

$$y_3 = -x$$

guides it, touches it, tangent, it's
bounded...one function within the 2

